National Science Board on December 6, 1953, and again on January 29, 1954. Following the latter presentation, the Board authorized Dr. Chester I. Barnard (Chairman of the Board), Dr. Detlev W. Bronk (Chairman of the Board's Executive Committee), and Dr. Alan T. Waterman (Director of the Foundation) to submit the program and budget to the Bureau of the Budget as a special, nonrecurring item, for the Bureau's analysis and consideration as an item that would be an addition to the President's current program for the fiscal year 1955.

Scientific Aspects of U. S. Program

The subjects with which the geophysical program is concerned are characterized by their close interrelationships. Thus, solar activity has pronounced and perhaps controlling influences on the ionosphere and on the electric currents of the atmosphere that contribute a variable component to the earth's magnetic field, and these strongly affect radio communications and navigation. The earth's magnetic field also has a significant effect on cosmic ray paths and motions.

Within each of the fields there exists a need for detailed information as a prerequisite to a fuller understanding of our geographical and geophysical environment. This information is needed not only within each field, but, because of the actual and suspected interrelationships among the fields, is needed simultaneously in all if we are to make a marked advance. Recent advances in the sciences broadly as well as advances in recent years in instruments and methods of measurements make propitious the timing of the proposed program. Increased knowledge of the upper atmosphere is needed for aviation, guided missiles, and electronic communication.

Moreover, the timing -- 1957 and 1958 for the years of intensified, special experimentation and observation -- coincides with a maximum in solar activity, which fluctuates over a period of about eleven years, and also coincides with some significant eclipses, which will permit careful examination of some aspects of the effects of solar activity perhaps best observed then, upon ionospheric, geomagnetic, and cosmic phenomena.

The objectives of the United States program involve the establishment of temporary stations in various quarters of the Northern and Southern Hemispheres of the Americas and adjacent regions and the stationing of observers, with appropriate instrumentation, at many existing stations in these regions. The zones involved include the continental United States, Alaska, South America, Central America, equatorial regions of the Atlantic and Pacific Oceans, the Arctic, and the Antarctic. While the problems associated with manning most of the stations in these regions are relatively simple, the Antarctic presents formidable problems, requiring major expeditionary activity that can probably only be achieved through logistic cooperation extended by the Department of Defense. This aspect is discussed further below.